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EXAMINER

NGUYEN, LAM S

ART UNIT

PAPER NUMBER

2853

DATE MAILED: 08/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/927,608

Applicant(s)

HAYN, ARMIN HEINZ

Examiner

LAM S NGUYEN

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 23 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 May 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 9 recites the limitation "said inlet" in the second line. There is insufficient antecedent basis for this limitation in the claim.

Claim 13 recites the limitation "the cage" in the second line. There is insufficient antecedent basis for this limitation in the claim.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-4, 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Coates et al. (US 4596929).

Coates et al. disclose an apparatus for detecting charged particles (FIG. 1, element 40), the apparatus comprising a chamber (FIG. 3: the space bounded by elements 47 and 42) for receiving said particles (FIG. 3, element 2) and being such that, in use, at least a partial vacuum is maintained in the chamber (FIG. 1 and column 2, line 59: as low vacuum as the chamber 26); an impact responsive sensor (FIG. 1, element 36) for detecting particles incident thereon, at least the part of the sensor on which the particles are incident being situated in the chamber; accelerating means (FIG. 3: element 36 is

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connected to a voltage supply 10-12KV) for providing, in the chamber, an electric field for accelerating charged particles therein towards the sensor and an electrically conductive barrier (FIG. 3: the grid 42 is powered by a 300V power supply) sealing the chamber to allow said at least partial vacuum to be maintained, the barrier being sufficiently thin to enable the charged particles to be detected to travel therethrough (column 3, line 10-16: the secondary emission electrons travel through the grid 42), and being electrically isolated from the accelerating electrode so as to be capable of being maintained at a different potential from the latter (FIG. 3: the grid 42 is electrically isolated from the accelerating electrode 36).

**Referring to claim 2:** in which the accelerating electrode is situated on or adjacent the sensor, and a connector for connecting said member to an accelerating voltage (FIG. 3: element 36 is connected to a voltage supply 10-12KV).

**Referring to claim 3:** in which the sensor comprises a scintillator for emitting light in response to the impact of a charged particle therewith (column 3, line 1-7).

**Referring to claim 4:** in which the scintillator incorporates said electrically conductive member (column 3, line 1-7: a corresponding conductive member is attached to the scintillator).

**Referring to claim 12:** in which the apparatus includes voltage source for applying a first accelerating voltage to said electrically conductive member (FIG. 3: +10-12KV) and a second accelerating voltage of the same polarity as, but lower than, the first accelerating voltage, to the barrier (FIG. 3: +300V).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Coates et al. (US 4596929) in view of Taylor, Jr. (US 5485008).

Coates et al. disclose the claimed invention as discussed above except that the sensor comprises an Everhard-Thornley detector.

Taylor, Jr. discloses a detector in a scanning electron microscope wherein the detector is an Everhard-Thornley detector (column 4, line 5-8).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the detector disclosed by Coates et al. such that to comprise an Everhard-Thornley detector as disclosed by Taylor, Jr. The motivation of doing so is to eliminate extraneous signal to the detector and lower the noise received in the detection signal as taught by Taylor, Jr. (column 4, line 9-13).

3. Claims 6-11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coates et al. (US 4596929) in view of Taylor, Jr. (US 5485008) as applied to claim 5, and further in view of Robinson (US 5043583).

Coates et al., as modified, disclose the claimed invention as discussed above and further comprising support means which extends across an inlet behind the foil to support the latter against pressure exerted on the membrane by gas outside the chamber (FIG. 3: a corresponding support means supports the grid 42) (**Referring to claim 9 with assumption that the inlet is already cited**), including an electrically conductive cage

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(FIG. 3, element 44) mounted in front of, but electrically insulated from, the barrier means (FIG. 3, element 42), the cage being connectable to an accelerating voltage (FIG. 3: +10-100V) for drawing particles towards the barrier means, the cage being so constructed as to allow the passage of particles therethrough (**Referring to claim 10**), in which the voltage application means (FIG. 3: +10-100V) is also operable to apply to the cage a further voltage, of the same polarity as, but lower than, the second voltage (FIG. 3: +300V) (**Referring to claim 13 with assumption that claim 13 depends on claim 10**). In addition, Taylor, Jr. discloses the including of a pump to evacuate the chamber (FIG. 3: the pump port 9) (**Referring to claim 11**). However, Coates et al., as modified, do not disclose that the barrier conveniently comprises a membrane of metallic foil in which the foil is aluminum (**Referring to claim 7**), in which the aluminium foil is of a thickness of 7.5nm (**Referring to claim 8**).

Robinson discloses an electron detector comprising a metal mesh grid connected to a positive voltage to attract electrons across the mesh and thus enable them to travel through to the detector (column 2, line 26-32), wherein the metal mesh grid is aluminium (column 3, line 9-15), in which the aluminium foil is of a thickness of 7.5nm (FIG. 1:  $100\text{\AA} = 10\text{nm}$  (about 7.5nm)).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the barrier means disclosed by Coates et al., as modified, such that the barrier means comprising a membrane of metallic foil in which the foil is aluminium as disclosed by Robinson. The motivation of doing so is to achieve the major advantage that is high electron transmission, nominally 90% as taught by Robinson (column 3, line 24-25).

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4. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coates et al. (US 4596929) in view of Taylor, Jr. (US 5485008) and Robinson (US 5043583) as applied to claims 1-10 and 12-13, and further in view of Sudraud (WO 98/22971).

Coates et al., as modified, disclose the claimed invention as discussed above and the detector is used in a scanning electron microscope (FIG. 1) having a sample chamber (FIG. 1, element 26) for holding a sample (FIG. 1: on the stage 34), generating means for generating a scanning beam of electrons and directing said beam onto a sample in said sample chamber (FIG. 1), wherein said chamber also contains detecting means for detecting secondary electrons emitted by the sample (FIG. 1, elements 36, 38, 40, 42)) (**Referring to claim 15**), and in which the electrically conductive member and barrier are connected to a voltage source for applying a voltage of +10 kV (FIG. 1: 10-12KV) to the member and of 0 to +1 kV to the barrier (FIG. 1: 300V) (**Referring to claim 16**).

However, Coates et al. do not disclose wherein the sample to be imaged in a gaseous environment and the cage is part-spherical or ellipsoidal.

Sudraud disclose a scanning microscope having a sample chamber wherein a sample is imaged in a gaseous environment (Abstract) and a part-spherical or ellipsoidal cage included in a detector (FIG. 4, element 26).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the sample chamber of the scanning electron microscope disclosed by Coates et al., as modified such that the sample is imaged in a gaseous environment as disclosed by Sudraud. The motivation of doing so is to accelerate

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the collision of secondary electrons and gas molecules to initiate a cascade of collisions which, in effect, amplifies the secondary electron signal as taught by Sudraud (Abstract).

***Response to Arguments***

Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S NGUYEN whose telephone number is (703)305-3342. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D. MEIER can be reached on (703)308-4896. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3431 for regular communications and (703)305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

LN

August 8, 2003

  
Benjamin H. Fuller  
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